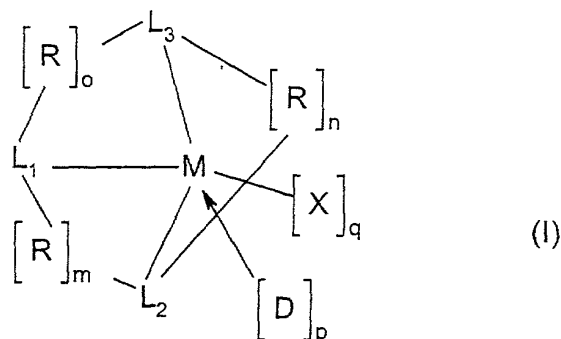


## Claims

1. Olefin polymerization catalyst component comprising an organometallic compound of general formula I



wherein:

**M** is a transition metal of groups 3, 4-10, lanthanide or actinide of the periodic table of the elements, preferably titanium, zirconium or hafnium;

each **R** is independently a structural bridge rigidly connecting two ligands **L**<sub>1</sub>, **L**<sub>2</sub> and **L**<sub>3</sub> and is constituted by 1 to 4 chain atoms selected from carbon, silicon, germanium, oxygen, boron;

*m*, *n* and *o* are 0 or 1, with the proviso that *m*+*n*+*o* is 2 or 3;

**L**<sub>1</sub> is a ligand of the cyclopentadienyl type or is isolobal to cyclopentadienyl, preferably a cyclopentadienyl, indenyl or fluorenyl ring, cyclopenteno[b]tiophenyl, cyclopenteno[b:b']-dithiophenyl, cyclopenteno[b]pyrrolyl, boratabenzene, phospholyl, dihydroindeno[b]indolyl, optionally substituted by one or more **R**<sup>1</sup> groups; most preferably a cyclopentadienyl, indenyl or fluorenyl ring, optionally substituted by one or more **R**<sup>1</sup> groups;

**L**<sub>2</sub> is a ligand of the cyclopentadienyl type or is isolobal to cyclopentadienyl, or a monovalent anionic ligand selected from the group consisting of N, P, B when *m*+*n*=2, it is selected from the group consisting of **NR**<sup>1</sup>, **PR**<sup>1</sup>, **BR**<sup>1</sup>, O and S when *m*+*n*=1;

**L**<sub>3</sub> is a monovalent anionic ligand selected from the group consisting of N, P, B when *n*+*o*=2, it is selected from the group consisting of **NR**<sup>1</sup>, **PR**<sup>1</sup>, **BR**<sup>1</sup>, O and S when *n*+*o*=1;

**R**<sup>1</sup> is hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>3</sub>-C<sub>20</sub> alkenyl, optionally comprising 1 to 5 heteroatoms such as Si, N, P, O, F, Cl, Br;

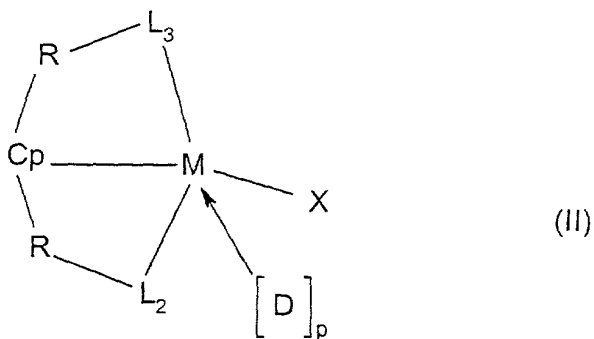
each **X** is independently selected from the group consisting of hydrogen, halogen,  $\text{NR}^2$ ,  $\text{R}^2$  with  $\text{R}^2$  equal to  $\text{C}_1\text{-C}_{20}$  alkyl,  $\text{C}_3\text{-C}_{20}$  cycloalkyl,  $\text{C}_6\text{-C}_{20}$  aryl,  $\text{C}_3\text{-C}_{20}$  alkenyl, optionally comprising 1 to 5 heteroatoms such as Si, N, P, O, F, Cl, Br;

**q** is a number whose value is: 0, 1, 2 or 3, depending on the valency of the metal **M**;

5 **D** is a neutral Lewis base,

**p** is a number whose value is: 0, 1, 2 or 3.

2. Catalyst component according to claim 1 wherein **n** is 0 and each **R** is independently selected from  $\text{CR}^1_2$ ,  $\text{SiR}^1_2$ ,  $\text{CR}^1_2\text{-CR}^1_2$ ,  $\text{CR}^1_2\text{-SiR}^1_2$ ,  $\text{SiR}^1_2\text{-SiR}^1_2$ ; wherein  $\text{R}^1$  is independently selected from hydrogen,  $\text{C}_1\text{-C}_{20}$  alkyl,  $\text{C}_3\text{-C}_{20}$  cycloalkyl,  $\text{C}_6\text{-C}_{20}$  aryl,  $\text{C}_3\text{-C}_{20}$  alkenyl, optionally comprising 1 to 5 heteroatoms such as Si, N, P, O, F, Cl, Br.
3. Catalyst component according to claim 1 wherein **D** is selected from the group consisting of linear or cyclic ethers, amines and phosphines.
4. Catalyst component according to claim 1 wherein the organometallic compound has formula (II)



wherein **Cp** is a cyclopentadienyl or indenyl ring, optionally substituted by one or more  $\text{R}^1$  groups, **M** is selected from Ti, Zr and Hf

20 each **R** is independently selected from  $\text{CR}^1_2$ ,  $\text{SiR}^1_2$ ,  $\text{CR}^1_2\text{-CR}^1_2$ ,  $\text{CR}^1_2\text{-SiR}^1_2$ ,  $\text{SiR}^1_2\text{-SiR}^1_2$ , wherein  $\text{R}^1$  is hydrogen,  $\text{C}_1\text{-C}_{20}$  alkyl,  $\text{C}_3\text{-C}_{20}$  cycloalkyl,  $\text{C}_6\text{-C}_{20}$  aryl,  $\text{C}_3\text{-C}_{20}$  alkenyl, optionally comprising 1 to 5 heteroatoms such as Si, N, P, O, F, Cl, Br.

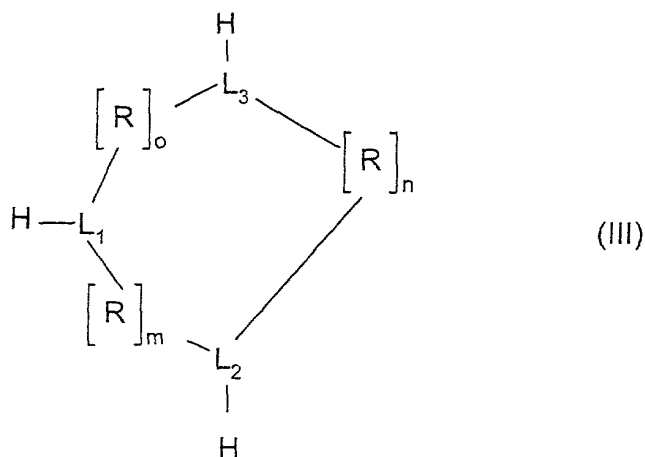
**L**<sub>2</sub> and **L**<sub>3</sub> are independently selected from the group consisting of  $\text{NR}^1$ ,  $\text{PR}^1$ ,  $\text{BR}^1$ , O and S;

**X** is independently selected from the group consisting of hydrogen, halogen,  $\text{NR}_2$ ,  $\text{R}^2$  with  $\text{R}^2$  equal to  $\text{C}_1\text{-C}_{20}$  alkyl,  $\text{C}_3\text{-C}_{20}$  cycloalkyl,  $\text{C}_6\text{-C}_{20}$  aryl,  $\text{C}_3\text{-C}_{20}$  alkenyl, optionally comprising 1 to 5 heteroatoms such as Si, N, P, O, F, Cl, Br.

**D** is a neutral Lewis base;

**p** is a number whose value is: 0, 1, 2 or 3.

5. Catalyst component according to claim 1 wherein **o** is equal to 0.
6. Catalyst component according to claim 1 wherein at least one **L** group selected from  $\text{L}_1$ ,  $\text{L}_2$  and  $\text{L}_3$  and/or one **R** group contains a  $-\text{O-SiR}^2_3$  group.
7. Catalyst component comprising a compound according to claims 1-6 and a porous support.
8. Olefin polymerization catalyst comprising a catalyst component according to claims 1-7 and a cocatalyst selected from aluminoxanes and boron Lewis acids.
9. Process for the preparation of catalyst components according to claims 1-6 including reacting a compound of formula  $\text{MX}_{q+3}$  wherein **M** is a transition metal of groups 3, 4-10, lanthanide or actinide of the periodic table of the elements, **X** is a monovalent anionic ligand and **q** is 0, 1, 2, or 3 depending on the valence of the metal **M**, with a compound of formula III



wherein

each **R** is independently a structural bridge rigidly connecting  $L_1$ ,  $L_2$  and  $L_3$  and is constituted by 1 to 4 chain atoms selected from carbon, silicon, germanium, oxygen, boron; these atoms can be part of fused rings, aromatics rings or spiro rings;

**m**, **n** and **o** are 0 or 1, with the proviso that  $m+n+o$  is 2 or 3.

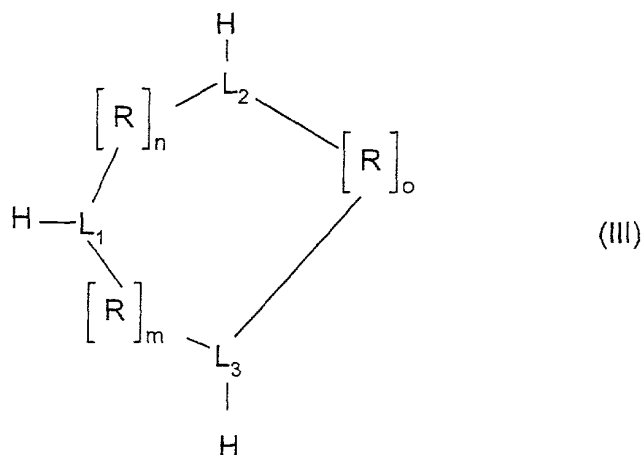
5  $L_1$  is a group of the cyclopentadienyl type or is isolobal to cyclopentadienyl, optionally substituted by one or more  $R^1$  groups;

$L_2$  is a group of the cyclopentadienyl type or is isolobal to cyclopentadienyl, or it is selected from the group consisting of N, P, B when  $m+n=2$ , it is selected from the group consisting of  $NR^1$ ,  $PR^1$ ,  $BR^1$ , O and S when  $m+n=1$ ;

10  $L_3$  is selected from the group consisting of N, P, B when  $n+o=2$ , it is selected from the group consisting of  $NR^1$ ,  $PR^1$ ,  $BR^1$ , O and S when  $n+o=1$ ;

$R^1$  is hydrogen.  $C_1$ - $C_{20}$  alkyl,  $C_3$ - $C_{20}$  cycloalkyl,  $C_6$ - $C_{20}$  aryl,  $C_3$ - $C_{20}$  alkenyl, optionally comprising 1 to 5 heteroatoms such as Si, N, P, O, F, Cl, Br.

15 10. Compounds formula III



wherein

each **R** is independently a structural bridge rigidly connecting  $L_1$ ,  $L_2$  and  $L_3$  and is constituted by 1 to 4 chain atoms selected from carbon, silicon, germanium, oxygen, boron; these atoms can be part of fused rings, aromatics rings or spiro rings;

**m**, **n** and **o** are 0 or 1, with the proviso that  $m+n+o$  is 2 or 3.

$L_1$  is a group of the cyclopentadienyl type or is isolobal to cyclopentadienyl, optionally substituted by one or more  $R^1$  groups;

5  $L_2$  is a group of the cyclopentadienyl type or is isolobal to cyclopentadienyl, or it is selected from the group consisting of N, P, B when  $m+n=2$ , it is selected from the group consisting of  $NR^1$ ,  $PR^1$ ,  $BR^1$ , O and S when  $m+n=1$ ;

$L_3$  is selected from the group consisting of N, P, B when  $n+o=2$ , it is selected from the group consisting of  $NR^1$ ,  $PR^1$ ,  $BR^1$ , O and S when  $n+o=1$ ;

$R^1$  is hydrogen,  $C_1$ - $C_{20}$  alkyl,  $C_3$ - $C_{20}$  cycloalkyl,  $C_6$ - $C_{20}$  aryl,  $C_3$ - $C_{20}$  alkenyl, optionally comprising 1 to 5 heteroatoms such as Si, N, P, O, F, Cl, Br.

10 11. Process for the polymerization of olefins characterized by the use of a catalyst according to claim 8.

12. Polyolefins obtainable by the process of claim 11.

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